

**REMARKS**

Claims 1-15 are pending in this application.

Although the Summary of the Office Action indicates that claims 1-15 stand rejected, the Detailed Action omits any explanation of how claims 10-12 are rejected. Accordingly, Applicant respectfully requests that the subject matter of claims 10-12 be designated as allowable.

Otherwise, the above-mentioned omission amounts to a failure to articulate a prima facie case of unpatentability and the burden to rebut this "rejection" has not yet shifted to the Applicant. Consequently, a next Office Action rejecting claims 10-12 cannot properly be made final since only then would the Applicant be obligated to rebut any "rejection" of claims 10-12, presuming that such an Office Action sets forth a prima facie case. See MPEP § 706.07(a).

**Rejection under 35 U.S.C. § 102(b)**

The Office Action rejects claims 1-7 under 35 U.S.C. §102(b) as being anticipated by Kamei (U.S. Patent No. 4,702,745, hereinafter "Kamei"). Applicants respectfully traverse the rejection.

Independent claim 1 recites:

A method for dewatering water-containing coal, comprising heating the water-containing coal at a temperature of 100°C to 350°C under a pressure not less than a saturated steam pressure at the temperature for the heating, while applying a shearing force of 0.01 MPa to 20 MPa to the water-containing coal, in a sealed vessel.

Kamei fails to disclose, expressly or inherently, within the four corners of the document not only all of the limitations claimed but also all of the limitations arranged or combined in the same way as recited in claim 1 and, thus, does not anticipate claim 1. See *Net MoneyIN Inc. v. VeriSign Inc.*, 88 USPQ2D 1751, 1758 (Fed. Cir. 2008) ("Because the

hallmark of anticipation is prior invention, the prior art reference—in order to anticipate under 35 U.S.C. §102—must not only disclose all elements of the claim within the four corners of the document, but must also disclose those elements 'arranged as in the claim.'

*Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 1548 (Fed. Cir. 1983).”

The Office Action asserts that the feature "applying a shearing force of 0.01 MPa to 20 Mpa" is disclosed by Kamei because the reference teaches that a load of 100 kg/cm<sup>2</sup>, which translates to 9.807 Mpa, is exerted. See Office Action pages 3 and 7, see also Kamei, col. 10, lines 5-7. This assertion lacks any merit and is technically inaccurate.

The 100 kg/cm<sup>2</sup> load disclosed at col. 10, lines 5-7 of Kamei is not a shearing force, as required by claim 1. As seen a col. 9 lines 36-39 of Kamei, this 100 kg/cm<sup>2</sup> load is applied to piston 35 of the testing system illustrated in Figure 7 of Kamei, which is not a screw extruder, to "press the sample mechanically." See Kamei, col. 10, lines 5-7. Clearly, the external forces (100 Kg/cm<sup>2</sup> load) acting on the pulverized sample in Figure 7 are at right angles to the sample and, thus, this is merely the ratio of the normal force to the area, i.e., "pressure." One of ordinary skill in the art at the time of the invention would realize that "pressure" clearly differs from a shearing force, which is associated with a ratio of the **tangential** force to the area of the face being sheared.

To the extent the Office Action asserts this feature is present in Kamei based on inherency, such bases are not properly established and are thus improper. Specifically, it is improper for the Office Action to rely on inherency (see Office Action, page 3) to establish that Kamei discloses "applying a shearing force," much less "applying a shearing force of 0.01 MPa to 20 MPa to the water-containing coal," as recited in claim 1, because the method discussed in Kamei does not **necessarily** possess all of the properties and characteristics of the method for dewatering water-containing coal recited in claim 1, which is required to support an inherency rejection.

As is well settled:

To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. **Inherency, however, may not be established by probabilities or possibilities.** The mere fact that a certain thing may result from a given set of circumstances is not sufficient.'

*In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999) (citations omitted). Furthermore, MPEP §2112(IV) states “[i]n relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art.’ *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990).”

The Office Action relies on col. 6. lines 7-12 of Kamei for the teaching of a screw extruder-type compressing-depressurizing unit and then merely asserts that a screw extruder type inherently provides a compression force as well as a shearing force, based on its design. See Office Action, pages 3 and 7. Clearly, this provides insufficient basis in fact and/or technical reasoning to reasonably support the determination that "applying a shearing force," much less "applying a shearing force of 0.01 MPa to 20 MPa to water-containing coal," as recited in claim 1, necessarily flows from the teachings of Kamei (emphasis added).

That the “screw extruder-type compressing-depressurizing unit” illustrated in Figure 3 of Kamei may mix materials and display a small shearing force under some circumstances does not mean that the screw extruder-type compressing-depressurizing unit necessarily applies "a shearing force," much less "a shearing force of 0.01 MPa to 20 MPa to the water-containing coal,” as recited in claim 1. Rather, the Office Action has not demonstrated that it is possible for an extruder, such as the one set forth in Kamei, to exert a shearing force of 0.01 MPa to 20 MPa. Furthermore, one of ordinary skill in the art would recognize the method and screw extruder-type compressing-depressurizing unit of Kamei mainly exert an

extruding or pressing force and would hardly allow for a "shearing force of 0.01 MPa to 20 Mpa," as recited in claim 1. Thus, for at least the above reasons, Kamei at least fails to disclose, either expressly or inherently, "applying a shearing force of 0.01 MPa to 20 Mpa," as arranged or combined with the other features recited in claim 1.

Additionally, Kamei fails to disclose a method of dewatering comprising heating water-containing coal while applying the claimed range of shearing force, as recited in independent claim 1 (and the dependent claims).

In contrast to the claimed invention, Kamei teaches applying *compression force* (rather than *shearing force*), and only *after* dewatering brown coal. In Figure 3, Kamei illustrates a screw extruder-type compressing-depressing unit (*see* Kamei, Figure 3 and col. 6, lines 7-8). Kamei teaches that "hot dewatered brown coal" is introduced through chute 10 into compression chamber 11. *See* Kamei, col. 6, lines 8-12. Unlike the claimed invention, the extruder in Kamei receives brown coal that has already been dewatered in heating chamber 2 (*see* Figure 1 of Kamei). The compressing-depressurizing unit (shown in Figure 3 of Kamei and shown as compressing-depressurizing unit 4 in Figure 1 of Kamei) then compresses the dewatered coal and pushes the dewatered coal out. *See* Kamei, col. 6, lines 12-21. *See also* Kamei, col. 5, lines 31-57, reproduced below for convenience.

As shown in FIG. 1, brown coal is charged into a heating chamber 2 through a sealing feeder 1 which seals the high pressure fluid in the chamber 2. A lock hopper, a screw feeder, a stamping extruder, a rotary valve, etc. can be used as the sealing feeder 1. A pump also can be the sealing feeder 1 because slurried brown coal also can be used. **In the heating chamber 2 brown coal is dewatered while the surrounding fluid is maintained at an elevated temperature and a high pressure by externally heating the chamber 2 or supplying a fluid of an elevated temperature and of a high pressure such as steam, etc. to the chamber 2 or by both. The dewatered brown coal is discharged through a sealing discharger 3, which seals the high pressure fluid in the chamber 2, to a compressing-depressurizing unit 4 which is composed of depressurizing chamber 5 and a compressing device 6. The brown coal in the chamber 5 is compressed mechanically and**

**consolidated** by an external load applied to the device 6, and keeping pace **with this, the pressure of the fluid surrounding the coal decreases.** Thus a dewatered and consolidated coal of low moisture and high density is obtained and pushed out from the unit 4 to the atmosphere by the load applied to the device 6. Instead of providing a sealing device 3 separately, the unit 4 itself can be used to seal the fluid in the chamber 2 utilizing the material sealing effect of the brown coal.

The Office Action asserts that Kamei teaches that the remaining moisture in the dewatered coal in the compressing-depressurizing unit is evaporated. See Office Action, page 3; see also Kamei, col. 6, lines 13-21. However, the Office Action overlooks that at this stage the pressure of the fluid surrounding the coal is lowered, allowing the remaining moisture to evaporate. Namely, Kamei discloses (4) a step of heating and pressurizing heating and pressurizing the autoclave to dewater the brown coal and (5) a step of applying a mechanical load to the brown coal, thereby starting to compress the solid structure of the brown coal. See Kamei, col. 4, lines 54-68 and col. 5, lines 1-15. Thus, the dewatering of Kamei is carried out by pressure reduction, without applying a shearing force, and then a mechanical load is applied to compress the coal and press the coal into a block. Thus, Kamei fails to disclose a method of dewatering comprising a feature of heating water-containing coal while applying the claimed range of shearing force, as arranged or combined in the same way as recited in claim 1 (and the dependent claims).

For at least the reasons set forth above, Kamei fails to disclose, expressly or inherently, within the four corners of the document not only all of the limitations claimed but also all of the limitations arranged or combined in the same way as recited in claim 1 and, thus, does not anticipate claim 1.

Furthermore, Applicants submit that the method disclosed in Kamei cannot achieve the results obtained by the claimed invention. As discussed in Comparative Example 1 on page 13 of the present specification, if a shearing force of as low as 0.001 MPa is applied to

the water-containing coal, the results were quite unsatisfactory. Comparative Example 1 of the present specification demonstrates the following:

The treatment was carried out similarly to Example 1 except that heating was conducted at 250°C under the pressure of 4 MPa for one hour with the shearing force set at 0.001 MPa. Dewatering the brown coal apparently occurred, but when the mixture was left for a while, most of the water, which had once removed from the brown coal, entered the brown coal again, and the slurry did not have the suitable properties.

Based on these results, it may be deduced that if *no* shearing force is applied during the dewatering of the water-containing coal (as in Kamei), the results would be inferior to results shown in Comparative Example 1.

In addition, Applicants note that the method disclosed in Kamei cannot remove water bound to coal by van der Waals forces because Kamei fails to teach heating water-containing coal while applying shearing force. In contrast, the claimed invention (as recited in independent claim 1) facilitates the removal of water bound to coal by van der Waals forces by simultaneously heating the water-containing coal and applying the claimed range of shearing force (as discussed in paragraph [0007] on pages 2 and 3 of the present specification). The Office Action asserts that there is no reason to believe that the method that Kamei teaches cannot remove water bound by van der Waals forces, but fails provide a basis in fact and/or technical reasoning to reasonably support this assertion. Applicant respectfully submits that the inferior results shown in Comparative Example 1 (above) demonstrate Kamei cannot remove water bound to coal by van der Waals forces because Kamei fails to teach heating water-containing coal while applying shearing force.

For at least these reasons, Kamei fails to disclose, either expressly or inherently, a dewatering method comprising applying a shearing force of 0.01 MPa to 20 MPa to water-containing coal *during* the dewatering of the water-containing coal at the claimed range of temperatures and pressures, as recited in independent claim 1 (and the dependent claims).

Furthermore, Kamei fails to disclose or suggest heating water-containing coal while applying the claimed range of shearing force, as recited in independent claim 1 (and the dependent claims). Lastly, Kamei fails to appreciate the advantages stemming from the aforementioned elements of the claimed invention (as illustrated in Comparative Example 1 on page 13 of the present specification).

Accordingly, Kamei fails to disclose, either expressly or inherently, each and every element of claim 1 and, thus, does not anticipate the claimed invention. Claims 2-7 depend from claim 1 and, thus, also are not anticipated by Kamei. Reconsideration and withdrawal of the rejection are respectfully requested.

**Rejection under 35 U.S.C. § 103(a)**

The Office Action rejects claims 8 and 9 under 35 U.S.C. §103(a) as being unpatentable over Kamei in view of Verschuur (U.S. Patent No. 4,216,082, hereinafter "Verschuur"). The Office Action also rejects claims 13-15 under 35 U.S.C. §103(a) as being unpatentable over Kamei in view of Verschuur and Gregory (U.S. Patent No. 2,824,790, hereinafter "Gregory"). Applicants respectfully traverse the rejections.

For the reasons set forth above, Applicants submit that Kamei fails to disclose, and likewise fails to teach or suggest, or establish any reason or rationale to provide all of the elements of independent claim 1, from which claims 8, 9, and 13-15 depend. Because the Office Action merely relies upon Verschuur and Gregory to teach adjusting water content in the final mixture and adding bitumen to the dewatered coal, Applicants submit that both Verschuur and Gregory fail to cure the aforementioned deficiencies of Kamei. Therefore, Applicants submit that Kamei, Verschuur, and Gregory (either alone or in any proper combination) fail to disclose or to have rendered obvious all of the elements of the claimed invention, as recited in claims 8, 9, and 13-15.

The cited references thus would not have rendered obvious the claimed invention.

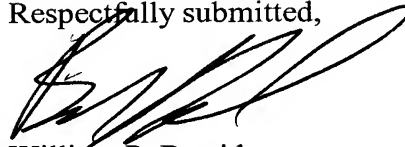
Reconsideration and withdrawal of the rejections are respectfully requested.

**Conclusion**

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of the application are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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